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The Collaborators' Dilemma

From Transaction costs to Transaction Capacity –
An Investigation of Collaborating SMEs in the Bergen Area

MSc in Innovation and Entrepreneurship

Olof Nilsson

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"It is the long history of humankind those who learned to collaborate and improvise most effectively have prevailed."

- Charles Darwin

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Abstract

The Oil and Gas subsea industry is predicted a great growth period in the near future. This releases a potential for new entrants to take part in a growing market. To enable small companies to take part of this growth and potential income in the Oil and Gas market requires new ways of thinking among the actors. Machining companies in Bergen are presently considered too small to manage contracts from the supplying companies (e.g. Aker, FMC) and this means most of the to contracts being signed outside the region. This challenge for the small companies to enter the market together maybe described as the collaborators' dilemma: if these companies do not collaborate they most likely will not be able to take part of the growing market share. Put another way collaboration may enable these companies to turn Transaction Cost into Transaction Capacity. This report investigates if, and eventually how, collaboration between machining companies could be designed. The method chosen in this research is to gather qualitative interview data, based on what the machining companies have emphasis on. Thus I have created a specific model for collaboration. Up to now the collaboration between the SMEs has been on ad-hoc basis, but my findings indicate that they believe a more formal collaboration would be more beneficial. The SMEs' preferred collaboration method is a Joint Venture, but this requires an agreement from main suppliers.

Preface

My name is Olof Nilsson and I am the researcher behind this report. My supervisors are Jarle Arstad and Jon Hellevang. Originally I am from Sweden and I have bachelor within Mechanical Engineering from the Royal Institute of Technology in Stockholm. In my previous studies I focused on Innovation and Design. Presently I am now finishing my Master Degree in Innovation and Entrepreneurship. Finally I would like to thank my supervisors and family for all their support throughout the work with the report.

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Abbreviations

[SMEs]	–	Small and medium sized Enterprises
[CNC]	-	Computer Numerical Control
[NCE]	-	Norwegian Centre of Expertise
[CCB]	-	Coast Center Base
[AS]	–	Aker Subsea
[KLM]	-	K. Lerøy Maskinering
[AC]	-	Anonymous Company
[PM]	-	Partner Maskinering

Introduction

The Oil and Gas subsea industry is predicted a great growth period the next couple of years (Westwood, 2011). This is due to the Oil and Gas industry technology development over the last years, enabling the industry into enter deeper and harsher environments. All these new findings expands the work portfolios of suppliers and additionally an increase in installed subsea equipment on the ocean floor also leads to a labor-intense future. To the extent of which it is possible to generalize in the subsea industry, subsea systems are designed, to last for 25 years. Additionally, subsea equipment needs to be recertified to the prevailing standard every five years to ensure functionality. Subsequently they are then relocated to the oil fields subsea. The recertification process lead to a predictable future within subsea service.

Norwegian Centre of Expertise (NCE) Subsea in Bergen, Norway, is a facilitator with many objectives; one of them being to "improve capacity within the region". NCE subsea would like to investigate how to increase large Oil and Gas related contracts going into the region. To enable SMEs to take part in the growth and potential money income of the Oil and Gas industry, innovative ways of thinking among the actors should be considered. Most of the small machining companies in the Bergen region are not considered big enough individually to manage contracts from the large supplying companies (e.g. Aker, FMC). To illustrate the large companies a recent contract signed by Aker was valued to one billion Norwegian kroner (Økland, 2012).

The machining companies included here are considered to small due to the large number of operations that are needed to create complex subsea installations. As of today this means that contracts are signed outside of the region. This report investigates if and eventually how collaboration between SMEs can be designed, leading to an increased amount of contracts staying within the region.

The dilemma or puzzle, which they face, is if they do not cooperate horizontally they may not be able to collaborate vertically with the big suppliers. The reason for this is that separately they have to high transaction costs but in collaboration these costs this may be turned into transaction capacity. To answer this question I have collected data from the machining companies based on qualitative interviews. This creates a good picture of the need and thoughts for creating a model for collaboration.

The research question in this report is to investigate:

What do machining companies comprehend as the future method of collaboration?

The companies included in this report, are: *Partner Maskinering AB* a precision mechanics workshop for prototype and series production. *Mento Service AS* a workshop with welding, machining and surface treatment. *Anononymous Company* is a mechanical machining workshop with CNC (Computer Numerical Control) capabilities. *K Lerøy maskinering* is a workshop delivering anything from medical equipment to house electronics lowered 6000m subsea. The machining companies will be interviewed and presented with a scenario. The scenario is created in collaboration with a potential customer within the industry. The machining companies are not big enough as regards either physical space, equipment, knowledge or manpower to handle contracts themselves from the large supplying companies on the top of the value chain. These companies are suppliers for the operating companies such as Statoil. Typically a supplier is assigned to handle all the parts that are to be installed on the seabed. A collaboration among the machining companies would give them opportunities in terms of for example penetrating new markets more specifically the Oil and Gas market.

Weber (1947) meant there are four main bases for social relations. Roughly they can be described with the words tradition, self interest, affection and shared purpose. These words are a good way of describing the focus of this report. The main area of focus is on how collaboration can be formed. To decide on how this should be done best, this report will investigate the SMEs own interpretation of how it should be formed. The reason for this is to enhance the impact of the report, and also to enlighten the participating companies on each other's preferences. If the stakeholders involved are interested and are able to see the value of collaboration, then the next phase of work is to decide on how to achieve the goals set.

My motivation for writing this report is based on a direct approach from actors in this market. Head of NCE Subsea Trond Olsen sees collaboration as a potential way of creating higher level of expertise within the subsea cluster. In a recent interview on NRK (Norwegian Broadcasting Corporation) Statoil recently announced that the

supplier capabilities and capacities in Norway are too small, and that new ways of thinking are needed to handle big contracts. Both statements strengthen the value of investigating new ways of collaboration to empower a high-cost country as Norway to stay competitive.

In this report a description of how the Oil and Gas value chain is shaped (fig.1) is presented. Additionally I will include some history about the Oil and Gas industry and how underlying factors has affected the Bergen region. Thereafter, I will guide you through the qualitative methods chosen in the methodology chapter, together with brief introduction to its nature and supplemented with a presentation of the interviewed *participants*. Under *Results* my empirical findings will be presented. Statements made from the interview objects, begins with the machining companies and followed by the purchaser's opinions. Further, my data is *discussed* based on theory. In search of the answer to the collaborators' dilemma I will then look into the characteristics of my results. Finally my conclusion is presented together with implications and suggestions for further studies.

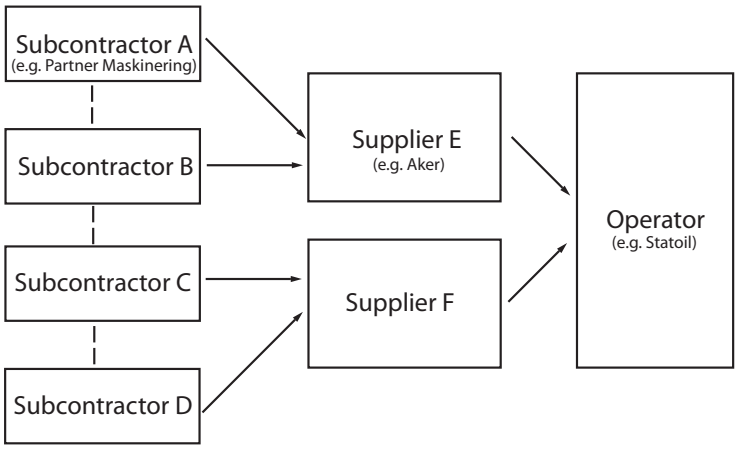
Background

Introduction

To describe the context of the companies involved I in this chapter present the value chain they are operating within. Porter (1998) means that the value chain of a firm and the way it performs individual activities are a reflection of the firm's history, its strategy, its approach to implementing its strategy and the underlying economics of the activities themselves. Further in this chapter is a brief introduction of the history of oil production subsea is presented, together with the development of the subsea cluster in the Bergen area.

Oil and Gas Companies Value Chain Structure

Figure 1 – Value Chain



In the following I am explaining the value chain of the SMEs. To describe the context of the Oil and Gas value chain within my context I have chosen to use the words of my interview objects.

The structure of the Oil and Gas value chain in the context of the machining companies can be described with three main actors. The *operators* are the Oil companies responsible for the development of the fields. They get their licence to operate from the governments. The *operator* then distributes VM (Maintenance Modification)-contracts to the oil *supplier* (among others Aker, FMC, Framo Eng, Aibel). The *suppliers* are responsible for the total delivery of equipment, which will pump the oil from the ocean bed to the surface including all the operations needed to get the job done. In many cases the companies responsible for development of the

fields are also contracted to maintain the equipment until the field is out of production. This is where the machining companies investigated in this report enter the picture. They are contracted by oil *suppliers* to refurbish equipment from the

History

Oil Production – Subsea

Oil was first found on the Norwegian Continental shelf in the late 1960's. The first major find was a field called Ekofisk, the oil reservoir is as large as 15 km long and 320 m high (equal to the Eiffel Tower) (Worldoil, 2009). It was with this discovery that the Norwegian Oil and Gas adventure began. Since then there has been great improvements of technology applied. Simplified, one could describe the oil adventure worldwide by dividing it into two different phases before and after drilling into the seabed. First came the common drilling onshore to find oil, which is nowadays often related to, the pump jacks found in Texas (among other places). The second phase could be described with pumping oil from sub sea level. As mentioned the drilling of subsea wells outside of Norway started in the late 1960´s and has been of significant value to the national economic growth (Energidepartementet, 2010). Today it is unusual to find major fields, but the geologists keep on finding smaller ones continuously. Additionally new technology has enabled operators to expand the capacity of existing fields. I should also mention that there has been major finds on the Norwegian Continental Shelf named Johan Sverdrup. Smaller fields have together with harsher environments increased the need for decreased costs bound to production. Therefore subsea technology development has taken off the last decades. Subsea installation means less manpower involved during oil production, also it can simplify the connection of many small oil fields into one making production more efficient.

Subsea installation as they function today may be described as big steel constructions providing an interface to the well on the seabed. The transportation form subsea installation to refinery can be done in multiple ways; flow lines to onshore, Production ships, production platforms. As in many other industries there are visions, the vision of the subsea industry is to submerge all oil production.

Ågotnes cluster

Outside the City of Bergen on the west coast of Norway there is a big gathering of companies related to the subsea industry. The evolution of the subsea cluster has been a natural development from initially having demanding customers in the shipping and offshore industry, to the Oil and Gas industry delivering more and more subsea equipment to the operators (Isaksen, 2009). One of the first companies to move here and start with Oil and Gas related activities was (Namtvedt) Coast Center Base. Today this is one of Norway's main supply bases – and one of the largest in Europe. The fact that this supply base was one of the pioneering businesses might be one explanation of why the business has been flourishing in the region. During an interview, managing director Kurt Andreassen of CCB expressed that they, since the beginning of the 1990s, have had a strategy where they wanted to become a facilitator of infrastructure to attract the best players. CCB had noticed that FMC Technologies (a global leader in equipment for the energy business) had started to put yellow things[1] on the seabed. CCB recognized the potential in the market and started their work by building a base with key attributes important for the development of subsea business. Among other things, they convinced Statoil that they should have all their subsea equipment at one location. This ended up with Statoil coming to Ågotnes and installing a subsea pool, storing all their subsea tools there. These innovative actions meant the start of a new era for the CCB and the subsea cluster at Ågotnes, leading us to where we are today with more than 100 companies tied to the NCE Subsea Cluster.

[1] All permanent subsea equipment is mainly painted yellow

Theory

Introduction

Collaboration can be shaped in many forms. My starting point for writing the theory chapter was to present a model of which I can base my research upon. In this chapter I present basic theory about value chains, and mechanisms related to the value chain consisting of transaction cost theory and integration. The theory chosen has given me an adequate framework of where challenges among collaboration may be found.

Complex networks are described as gatherings, which involves a large number of co-producing actors delivering a variety of products and services (Haugland et al., 2011). A network can be very complex even though to it is perceived as one unit by the customer. Machining companies in the Bergen area are today spread geographically over the region and only collaborating on an ad-hoc basis. There are many potential reasons that may have caused this, but globally there are numerous examples that it is quite difficult to establish interorganizational coordination among small, independent companies (Saxena and Ilbery, 2008, Tinsley and Lynch, 2001).

Haugland et al., (2011) list three main reasons that might explain some of the difficulties when coordinating small companies. The focus of the article is the service industry but is similar to my context. Companies may lack necessary financial and managerial resources to establish coordination, and managers in small companies often have limited time to devote to such activities. There may be disagreement among the companies concerning how to share costs and benefits, and it may be difficult to find a company that is willing to as coordinator. Companies may also be unwilling to invest resources in cooperative initiatives because they may fear that other companies just want to reap the benefits while refusing to carry the costs.

When comparing the service industry and the machining companies' similarities are to be found. In both cases there are independent companies competing against each other: both are small and therefore sensitive to the economic cycles (Cravo, 2011).

Furthermore Haugland et al., (2011) describes how other industries, such as retailing and service sectors, have responded when faced with similar challenges. In the article they describe it as something that has been done through implementing vertical and

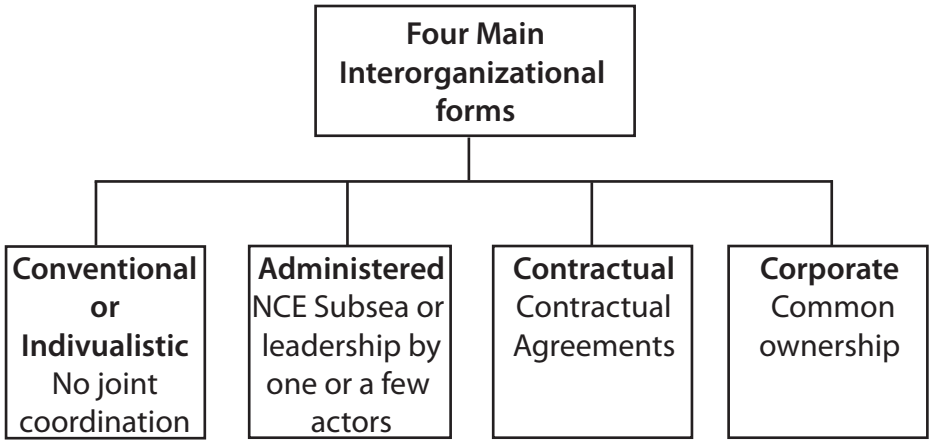
horizontal integration, linking companies closer to each other and thus enabling closer coordination. These are different mechanisms for achieving closer cooperating such as, contracts, governance structures and common ownerships. The retail and service industry is a good illustration of where individual companies/stores becomes part of a service chain and therefore for example expands their marketing ability without increasing costs.

Transaction cost economies Williamson (1985) gives a theoretical perspective when investigating and classifying interorganizational structures. Interorganizational structures are classified according to the market and the hierarchy continuum. This is presented further under *Transaction Costs.*

Haugland et al., (2011) illustrate the market and hierarchy continuum dividing it in two sides; the market side were relationships are loosely coupled without much of a formal structure. The relations on the other side of the continuum are opposite, tightly coupled and more formally organized. The continuum described is often illustrated by placing four different categories along the continuum. The four different categories described above represents different structures and varied degree of integration illustrated in figure 2 below originally created by Dunne et al., (2002). The *Conventional and Individualistic* form indicates no shared coordination of activities across companies. Each company operates separately, and any coordination takes place on an ad-hoc basis. The *Administered* form companies work together voluntarily and under a low degree of formality in order to coordinate activities that are non-competitive such as, marketing, procurement etc. *Contractual* form implies a stronger degree of coordination of companies and where there is a higher degree of formality regulated through formal contracts, and from time to time in combination with equity arrangements. *Corporate* form all the companies involved handle coordination.

Haugland et al., (2011) argue that even though these forms primarily have been used for distribution and retailing. In fact he argues that the model could be used for investigating the relationships between actors/companies at tourism destination as well. According to this statement the model is applied in my research to describe collaboration, in this case between the machining companies within the Bergen region.

Figure 2 – Model of Interorganizational Forms



I have redefined the model used by Haugland (2011) for my purposes, presented in figure 2. In this report the different boxes represent diverse ways of collaborating. Using the boxes to organize the companies and which type of collaboration they prefer.

Value Chain

Every company is a collection of activities that are performed to design, produce, market, deliver and support its product. All these activities can be represented using a value chain. A firm's value chain and the way it performs individual activities are a reflection of the firm's history, its strategy, its approach to implementing its strategy and the underlying economics of the activities themselves (Porter, 1998).

A common view of industrial profitability is that profits are a function of the balance between supply and demand. If demand is greater than supply, this leads to profitability. Supply and demand change constantly, and as Porter (1998) mentions, Industry structure often determines how rapid competitors are to add new supply. It is the shape of the entry barriers, which will be the most important decision point for new players to enter an industry. Entry barriers in the Oil and Gas industry are rather high due to investment costs bound to oil production (Fortson, 2004). Considering the fatal outcomes that might occur if something does not go according to plan like the recent deepwater horizon catastrophe in the Gulf of Mexico the cost bound to quality is understandably high. The high costs and requirements bound to quality are transferred through all players in the Oil and Gas value chain resulting in many requirements to become a supplier or sub supplier. High standard and lots of

regulations means the need for supervision and control is high in the industry. During an interview held in conjunction to the thesis, a mayor supplier in the industry (Aker) expresses the importance of control on their sub-suppliers and the benefits of having suppliers close is mentioned. Cohen and Levinthal (1990,p. 128) mention absorptive capacity, which "confers an ability to recognize the value of new information, assimilate it, and apply it to commercial ends". To succeed in applying new external information, intentional information seeking is a prerequisite Cohen and Levinthal (1990), and research suggests that learning often occurs close to current operations and capabilities (Tortoriello and Krackhardt, 2010, Cohen and Levinthal, 1990).

Vertical and Horizontal Integration

Vertical and Horizontal Integration are strategic tools companies can use to expand their operations. Vertical integration is used to increase control in terms of assuring consistent and predictable supply chains. Vertically integrated companies in a supply chain are united through a common owner (Porter, 1998). The latest example of vertical integration I can come up with related to the Oil and Gas industry is the acquisition Delta Airlines recently did. The American airline recently bought a ConocoPhillips refinery to lower their fuel costs, which today is a big issue amongst airlines "resulting in expected 2012 fuel savings of more than $100 million" (Holland, 2012).

Horizontal Integration/coordination on the other hand is when similar companies merge or are acquired and are in the same stage of production and in the same type of industry. It is a strategy used to for example to sell a type of product in numerous markets. Horizontal integration among a number of firms within an industry does according to Perry and Porter (1985) lead to formation of a firm that due to having a higher capital share, is larger and in different shape than its constituent elements and this makes integration profitable for insiders. Horizontal coordination can be accomplished in a number of ways. Through Meetings, project groups, positions or departments with coordination responsibilities, Matrix structures and Network organization (Bolman and Deal, 1998).

Transaction Cost Theory

Collaboration requires companies to act in fellowship within the areas concerned. A company cannot both collaborate and do its own thing within these areas. Such a strategy may ruin the relationship. To be perceived as one unified party some sacrifices are necessary. These sacrifices also lead to stronger bonds and dependence in the collaboration between parties. Collaboration is therefore to some extent about surrendering your independence as a company (Cannon et al., 2000, Hallen et al., 1991, Hammarkvist et al., 1982).

Asset specificity is defined by McGuinness (1994) as the extent to which the investments support a specific transaction have a higher value to that transaction than they would have if they were implemented for any other purpose. When seen in the light of the SMEs this means with asset specific investments the return is lower outside than inside of the collaboration. The investments are therefore more or less specific for the relation; you could say that the parties are tied up to each other. Big asset specific investments represent a big potential loss and large dependence upon the counterpart. At the same time less investments represents a lower potential of loss and therefore also less dependence on the counterpart.

In transaction cost theory places emphasis on asset specificity. According to Williamson (1991, 1985) it is the extent of the asset specificity that determines the bonds and dependence of the relationship. Asset specificity can be of both material and immaterial character. Ranging from investments in physical equipment (building and machinery), human capital (employees with special competencies) to organization and strategy (development of common routines and systems). Asset specificity is often a process, which happens over time. Costs as well as bonds usually increases gradually over time as the relationship develops and the magnitude of relationship-costs are often hard to predict.

In transaction cost theory it is assumed that economic actors are rationally limited and might act opportunistically. With limited rationality we can understand that actors wishes to maximize the number of decisions made on rational basis, but this is in many situations not possible and therefore is only achieved to a certain degree. This means that when collaboration is to start, companies may not be capable of evaluating and predicting all possible outcomes of the collaboration. Opportunism is can be

defined as “Self-interest seeking with guile” (Williamson, 1985). This includes actions such as lying, stealing cheating and so on. Opportunism refers to conscious actions to exploit circumstances and information for own gain, without consideration of the counterpart. This does not mean that all actors will act opportunistically, but according to transaction cost theory one is never to be totally sure of who might act opportunistically and whom that will not.

According to Haugland (1996) it is important to se relation specific investments in the context of limited rationality and opportunism. Limited rationality means, when such investments are made, companies are not able to fully assess the consequences of the investments. The condition that the collaborating companies might be operating opportunistically exposes both parties for risk, since there is no overall guarantee for the counterpart to follow all the promises agreed upon in a contract. Even though a counterpart has signed an agreement, which is by law, binding. There is always a possibility of situations occurring, when the counterpart finds it profitable to act opportunistically and break the agreement before both parts has collected the return of investments made.

Intuitively collaboration will work the smoothest if the parties have invested equally based on their ability. The reason for this is that the investment indicates the parties interest to the collaboration. Haugland (1996) points out that is relation specific investments is a good solution both for customer and supplier when it is possible to portion the investments over a big number of units produced. Furthermore Haugland mentions that the transaction cost theory primarily was developed with vertical relations, and thus we are able apply the core of the theory also for collaboration in general.

Summary

The interorganizational model presented (Figure 2) is used further in this report when describing present and future forms for collaboration. The model is also used as a foundation for the interviews conducted. Additionally theory related to Value Chain is brought up in the discussion where I elaborate further on the collaborators dilemma. To enable a discussion data is needed and my method for collecting data is presented in the next chapter.

Methodology

Introduction

The driver for the thesis is to gather experience from an industry together with thoughts and opinions of how future collaboration can be formed. Through interviews with both customer and supplier a broad picture can be presented. The method chosen is qualitative and conducted through interviews to provide a good understanding of problems and expectations of collaboration. In this chapter I describe the method chosen, the theory behind and validity of the report.

Natural language data

The data collecting method used in this report for gathering information (data) from managers and employees is called *natural language data.* This particular method was chosen due to its ability discover the views, perceptions and opinions from both individuals and groups through language, and the method used to achieve this kind of data is in-depth interviews (Mark Easterby-Smith, 2008). Due to the lack of knowledge about this particular subject and the findings yet to be unveiled, natural language data have a way of covering ground unknown to the researcher. This can be a great asset when collecting data since aspects from the interview object would not have occurred. But there are also other methods to gather information such as diaries and the examination of company reports or video recordings.

When to gather *natural language data* there are multiple alternatives to choose from. Interviews can be very formal and structured or very loosely formalized and unstructured. Examples of the above-mentioned are, market research (structured) and free-ranging conversations (unstructured). Easterby (2008) argue that while collecting data using less-structured interviews, researchers should make choices as to which line of questioning the researcher should explore further, and which lines of inquiry to discard. He also mention a few warnings around structuring interviews. Interviews that are “non-directive” tend to rather than to paint a picture out of the data gathered, make it fairly invisible.

In-depth Interviews

(1982 p. 107) summarises the importance of in-depth interviews ´the interview is …the opportunity for the researcher to probe deeply to uncover new clues, open up new dimensions of a problem and to secure vivid, accurate inclusive accounts that are based on personal experience'. There are a wide variety of interview practices to choose from between the two extremities of informal and very structured (Jones, 1985). Most interviews are conducted on a one to one basis, between interviewer and the interview object. The main aim of qualitative interviewing is generally seen as attempting to understand the situation and perception of the interview object and why they have that specific viewpoint (King et al., 2004). In order to fully exploit the interview objects it is important to not only have insights of the subjects discussed but also have the knowledge needed to help the interview object to assist individuals to further explore their own beliefs. Interviews are according to appropriate methods to use when: It is necessary to understand the constructs that the respondent uses as a basis for his or her opinions and beliefs about a particular matter or situation; The aim of the interview is to develop an understanding of the respondent's 'world' so that the researcher might influence it, either independently, or collaboratively; The step by step logic of a situation is not clear; the subject is highly confidential or commercially sensitive; and there are issues about which the interview objects may be reluctant to be truthful other than confidentially in a one-to-one situation (Mark Easterby-Smith, 2008).

Pre Data Collection

To describe the situation of the machining companies interviews have been conducted. The data I am to collect is an analysis of if there is a need for collaboration between machining companies. What the involved parties see do today and how they see a future collaboration come together. To cover the need analysis, qualitative data from the involved parties is from my point of view a necessity. Such a method enables me to adjust/redirect question if they are not totally accurate in the first place. The qualitative method chosen for collecting data for this project is interviews with selected managers of machining companies. This method was chosen, due to its ability to help the researcher gain an understanding from the respondents perspective (Jones, 1985). Interviews where performed with a semi structured interview guide. The interviews are divided in two where it is first an explanatory part where the

objects tell me about their experience and thereafter presented with a scenario "from a potential customer". From there the interviews are more constructive were the interviewees can say how they would like collaboration to be formed. My goal is to uncover new clues, and discover new dimensions to the companies' interpretation of how to frame collaboration. Interviews will be performed with a semi structured interview guide. The individuals interviewed were notified in advance; also receiving a draft of the interview to get the possibility to correct and approve. This was done to increase the openness around the interview situation.

The widespread business relations established through the Norwegian Centre of Expertise (NCE) subsea network are a possible way of finding the relevant parties of interest. The involved parties of interest for collaboration are the main suppliers who will act as the closest customers for the machining companies. From the machining companies interviews was held with one manager from each company.

Past Data Collection

After the data collection an analyze phase was started. Thus the interviews were transcribed. By first analyzing the responses independently and thereafter comparing the different responses with each other extraction of similarities and differences are possible. The responses where put into a table (table 1) to visualize the landscape of what the different companies/parties put there emphasis on regarding collaboration both from experience and future.

Customer Scenario for Data Creation

To create data for this report a scenario was created together with one of the oil supply companies (Aker). The scenario is a fictive description of a future scenario. Using a scenario will hopefully help the machining companies go deeper into their mindset and come closer to a factual solution rather than just being interviewed and answering questions they can speak their minds about things related to the scenario as well. It can help put initial thoughts into perspective. Hopefully a scenario will also help the machining companies to approach the scenario in a more comparable way.

Reliability

Using interviews as my chosen method I do recognize the implications it has. To replicate this study and have the same results will be achievable, but hard. This is due

to the fact that I am the one selecting data and my perception and personality of what has been said during the interviews will show throughout the data. Nevertheless this is in line with social constructionist perspective and is considered to enrich the report (Mark Easterby-Smith, 2008). High level of transparency is achieved by using recorder during interviews, accurate transcription of the interviews as well as storing of the recordings.

Unit of Analysis

To ensure collection of useful data to this research my interview objects are Managers/ Managing directors at machining companies. They possess a broad picture of the companies and also the mandate to change the vision of their businesses as well as the path of how to get there. From the customer side a person with experience or relations to purchase department is chosen.

Validity

The validity of qualitative research is to what degree the data can be seen as accurate and appropriate with respect to the chosen research question (Denscombe, 2007). There are different tests used when handling social science methods such as Construct validity, Internal validity, External validity and Reliability

Construct validity concerns how well the data used is a good measurement of the chosen research topic (Bryman and Bell, 2007). In this study the construct validity is represented by how well the conducted interview data correspond to the true meanings of the interview objects. Yin (2011) argues there are three main tactics to use to ensure validity of case study research; use multiple sources of evidence, establish chain of evidence and have key informants review draft case report.

To increase the validity of the report me being there physically to see reactions and ask follow up questions when needed. Also my supervisor, who has experience from collaboration studies, continuously reviews the data used. In addition this study has established a chain of evidence. The chain of evidence consists of recorded, raw sound files together with transcription of conducted interviews and memo notes. Also sending the transcription of the interviews to the interviewees ensured accuracy of the data. This has been an iterative process and in my opinion improving the quality of the information gathered.

For the main focus of this research I chose to interview four companies within machining and their potential customer. Using multiple sources of evidence is one of the main tactics to construct validity (Yin, 2011). This I have emphasised by carefully selecting companies together with NCE Subsea, who has good connections within the business region of Bergen. NCEs knowledge of the companies make sure that the ones selected are representative. Interviewing a range of managers in the region secure that the data from the machining companies are valid. Since I am researching on management level among the regional industries I see the need for interviewing a set of objects to get the full picture. Furthermore, I have chosen to increase my validity by using data from both sides of the dyad. Not only interviewing the managers of the small companies but also an influential employee within strategic sourcing at a potential customer company. This definitely helps broaden my perspective of how the industry works and what the different views of the interview objects are and how they are relate to each other.

Using Dunne et al. (2002) model as a base when writing the interview guide enforces the accuracy of the questions formulated. Furthermore, the semi structured interview used increases my ability to seize situations described and also decreases the risks of misunderstandings that could occur if using a quantitative method. To reduce the risk of further misinterpretation, I have chosen to present a scenario during the interview. The scenario (see appendix) introduces a framework for why collaboration is needed, and was selected to stimulate the interviewees into a similar mindset when answering questions concerning future collaboration.

Summary

The method chosen for this thesis is a qualitative study. In depth interviews are conducted with managers of machining companies carefully selected together with NCE subsea. To ensure high validity interviews are done on both sides of the dyad with both customers; in this case Aker Subsea and the machining companies. The Interviews conducted has been of great value for creating the results presented further on in the report. Finally I am presenting a brief introduction to the selected companies followed by my results.

Involved Parties

Norwegian Center of Expertise - Subsea

"NCE Subsea contributes to the strengthening and internationalization of the subsea industry in the Bergen area. More than 100 companies and organizations are part of the cluster network NCE Subsea."

NCE Subsea is a facilitator in the Bergen region who helps to contribute to closer relations between companies in the subsea industry. NCE Subsea among other things organizes seminars, lectures and contributes to interaction between R&D institutions and companies within the cluster to increase collaboration and innovation in the region.

Aker Subsea

Aker Solutions is a global oil services company that provides engineering services, technologies, product solutions and field-life solutions for the Oil and Gas industry. To this report Interviews where held at the subdivision Aker Subsea at Ågotnes. The Aker Subsea group is organized in a number of separate legal entities. Aker Solutions is used as the common brand/trademark for most of these entities.

Interview Object: Strategic Sourcer

Partner Maskinering AS

Partner Maskinering is a modern, finemechanical workshop for prototype and production series. Partner AS processes most materials and utilize methodic work processes in their production. They offer the best manufacturing equipment available. The company was established in 1996. In 2008 they had a turnover of 50 MNOK and are today 25 employees.

Intreview Object: General Manager

Anonymous Company

This company is a mechanical machining workshop based in the Bergen region. Experienced people within the CNC - machining discipline, established the company in the 90-s. Today this company is a multi discipline machining company with approximately 30 employees and well above 2000 m^2 production facilities. The

turnover is roughly 40 MNOK. A broad selection of stainless hydraulic components is offered, combined with advanced machining capabilities for the offshore/subsea sector, everything based on customers design and needs.

Intreview Object: General Manager

K Lerøy Metall AS

K. Leroy Metals Ltd was founded in 1957. The main activity was in the start fittings for the furniture industry in Osterøy and surrounding areas. Now 50 years later their product range has extended further. Over the past 30 years they have specialized in the production of tolerance demanding components. These components are found in everything from aerospace equipment, medical equipment to house electronics that lowered 6000 meters into the sea. Today they are over 40 employees with a turnover in 2008 approximately 65 MNOK.

Intreview Object: General Manager together with HR/Financial-manager

Mento Service AS

Mento AS is a Norwegian owned company established in Stavanger in the 1970-s. The company's purpose is to trade rental, production, testing and service of products mainly bound to the Oil and Gas industry. Mento Services AS formerly known as Strømme Group AS was merged with Mento Service AS in 2011. Mento Service AS provides services within the fields of, Mechanical Solutions Fabrication, Service, Testing and Engineering. The company have the biggest machining capabilities regarding size of parts among the companies interviewed. Mento Service AS has approximately 55 employees and a turnover of 68 MNOK.

Interview Object: General Manager

Results

In this chapter my results are presented. The results are split in two and include both the view of the machining companies and customer. Additionally, after mapping their experiences the interview objects were presented with a scenario. The scenario was intended to stimulate common mindset and collect information on how a future collaboration could be shaped. Initially statements made from the interview objects starting of with the machining companies followed by the customer are presented. In the end of the results chapter the data are summarized in a table (table 1). Further, the table is referred to in the discussion. The conducted interviews have been successful in providing useful data about the regional machining industry. I should mention that due the prevailing circumstances with strictly limited use of time during interviews, one of the interviews was not completely successful. This might be as a consequence of personal chemistry or other. Leading to me not being able to get the data I was searching for. Therefore I have chosen to exclude the data from the company mentioned in the report.

There is definitely a motivation for collaboration among the majority of the companies interviewed. Collaboration seems to be a topic that has been discussed and also tried before with the companies interviewed. The motivation is mainly due to large growth in the subsea industry and the monetary benefits of serving the oil industry. Their motivation and opinion of how collaboration should be formed is presented in this chapter but first a description of the situation as it occurs today.

The companies included in this research are in the region of 50 MNOK in turnover and have approximately 30 employees. Customer bases are mainly national players in widespread sectors in everything from furniture to engines. The spectre of machining capabilities is up to a dimension of approximately 650 mm in three out of fours companies. This is an inhibitor when to engage subsea suppliers.

SMEs – Experience

Former Experience

As mentioned earlier collaboration has been a topic for all companies in the past and one of them also tried it and shared their experience. The organization they had was a sales organization commonly owned by three separate parties. He mentioned a few learning outcomes that should be thought through when to collaborate. Starting collaboration should, according to the experience of Partner Maskinering (PM), be to enter new markets or attract more work into the region. By doing so you can decrease the risk of interfering with the other parties' own interests when collaborating.

Furthermore there is an uncertainty of what the oil company suppliers really want to accomplish, and if they want to collaborate regionally. (PM) says, "*We feel that we cannot reach them. What ever happens over there happens, but we cannot se it*." There is a lack of trust to the subsea suppliers when the machining companies states things like, "*some contracts they write are just framework agreements, those agreements are not worth the paper they are written on",* - Anonymous Company (AC).

The uncertainty around what to expect from regionally located corporations are not the only concern mentioned. All companies bring up the subject of predictability. From my understanding all companies would like to see an increased ability to predict future orders/contracts. The majority of the companies presented some type of relation to customers, which seemed to be working really well. PM could also here work as an example. They are today one of five chosen "main suppliers" to a mayor player in the marine industry. Being assigned a formal contract as such, "main supplier" is according to PM creating more reliability in the relationship *"Having a stable relationship in good and in bad times… if the customer wants a reliable relation, then he has to give some promises too"*. In addition PM states, to become a supplier for any company there are three main things to consider: *"Precision in delivery, Quality otherwise precision in delivery does not mean anything and price. The last one is the qualification to get the opportunity to deliver"*.

Collaborations Today

Descriptions of the interactions between the companies today are in all three companies when in lack of capacity. The collaboration is on ad-hoc basis without any formalized contracts. Using the words of K Lerøy Maskinering (KLM) "*The advantage of ad-hoc collaboration is that we are able to control our own everyday, we can choose projects that guides us towards the direction we think suits us"*.

As I have mentioned earlier the companies were first asked to describe collaboration and experience gathered, hereafter they were presented with a scenario of how the near future could require collaboration of small companies. Their thoughts around how this collaboration should be formed and where problems might occur are presented below.

SMEs - Future Collaboration

Biggest Problem; Finance, Time or Human Resources?

When I begun with the interviews I had the understanding of companies expressing finances as a problem. However this idea was revised on more or less all of the interviews where finance was could be described with a citation from (KLM) "*I do not have any faith in financial resources being an obstacle"*. This citation was in some type or form repeated at all companies except from Mento Services AS (M). M did express*" It is costly to invest, When investing in something it is something you believe in or have signed a contact on"* which the other companies did express as well. A summary would be, money is not a problem when you believe in what you are doing, expressed with for example a contract.

So finances were not as I expected an obstacle, but what is then. Surprising to me I found that out of the three areas: Finance, Personnel and Time. The biggest worry of the machining companies were to find competent people. As KLM says "*Human recourses is a challenge in Norway these days with an unemployment rate of only 3%"* (SSB, 2012). Also the Anonymous company (AC) thinks human resources might be a problem but also believe there might be another side to the story. AC thinks that if two or three machining companies were to start a new venture together this might be a way to attract competent individuals *"If we present the new company as something extra, you might loose employees from yourself. The challenges are big*

with human resources, it is". The common denominator of why it is hard to hire qualified people is, the oil industry that usually is able to offer higher salaries and therefore is more attractive than other industries such as the machining industries.

Concerns Collaboration

During the interviews I wanted to find out what worries the companies around collaboration, this to reduce future problems if/when to form a collaboration. The question I presented was *"what is the biggest challenge with collaboration?"* Both AC and KLM think the biggest problems will occur when and if things are not going well. They both see the importance of on beforehand deciding what to do when things looks pessimistic. KLM says, *"...the key for success is that you have thought and talked thru possible negative scenarios…then you may try to find different solutions which are not always compatible, it depends on philosophy, mindset and experiences."* For the same reason getting to know each other properly before starting collaboration is mentioned as important. This could be done *"…over a drink or two"* as AC puts it. From experience PM mention another aspect of the same problem. PM say, *"to open up to much for your competitors means you will get bigger insight in their business…it is that primitive reaction I am afraid of. The competitiveness between the collaborators must not increase after engaging collaboration"* also PM sees a problem with it not *"being common culture"* have suppliers collaborating so it is important that such collaboration is customer driven.

M rather focuses on the problem with all companies being busy at the same time. This scenario was mentioned at all companies. I was told during one interview that *"when times are good you get eight out of ten orders and when times are bad you get two out of ten"*.

Structuring Collaboration and Expectations

When presented with the Aker scenario (see appendix), all companies have thought of creating a formal collaboration with a Joint Venture, meaning starting a new company together, which is formally independent from the mother companies. Common thoughts are that investing in something new together means you have faith in the project created. AC means you should enter such a collaboration *"as individuals (privatpersoner) and create a Joint Venture"* this would then decrease the all over risk of the parties involved not *"dragging along mother companies if things does not*

go according to plan". PM sees problems with trying to merge companies and therefore starting a new one is a better alternative. PM also points out that collaboration is a process, and starting out with collaborating on contracts is a good alternative. From there the collaboration might flourish into a Joint Venture if working well.

The thoughts around how to structure the collaboration within the new company is not totally unified even though there are similarities. KLM, *"it might have been a benefit to enter collaboration with a competitor…with another dimension range than what we are able to produce today"* this is in line with PM who says, *"We have this type of equipment within the group/collaboration. As a cluster we lack this type of equipment, that is where we should invest"*. AC is also thinking a bigger picture with big investments to being able to take on total package solutions. AC:s words *"If someone would dare to invest in a facility over 2000m^2 and 12-15m height... Equipment close to 70-80 MNOK worth."*

Companies are unanimous on creating a Joint Venture where all parts own shares. Therefore the cost/profit would be shared as in other similar constellations where costs/profit is shared according to number of shares. Some type of input-output equation is desirable meaning, your profit match your input to the company.

Expectations

What are the expectations to your collaboration partner? I aimed to explore what companies' value in their counterpart. PM, KLM and AC all say moral, loyalty, honesty and openness are important factors. Staying within the framework agreed on is also considered important. Overall it seems to be agreed on that if having collaboration all parties involved should want it as much.

All companies would like more predictability from the customers . This is something that is brought up in all interviews. They would like something sustainable and not just a general agreement. PM expresses a *"fear of price dumping from already involved suppliers to Aker"* and says that is what PM would have done. Therefore a sustainable agreement would be of great value. Similar to this AC would like to *"get a hint from the big customers that a collaboration is desirable. That might be the necessary 'kick in the back' for those who are willing to take a closer look at this project"*.

An expectation of collaboration is that it of course should bring financial benefits. In addition all companies see other possibilities. KLM thinks it could *"develop our own business with knowledge and synergies. Get more knowledge in new areas. You broaden your network, get access to new point of views and doors available to you"*. Furthermore PM thinks *"building new competence together with the others to strengthen your company is a benefit"* also mentioning, "To enter collaboration might be beneficial in terms of the cycles in the industry. *It is not always a good solution to invest in new equipment when busy. One could have orders made at a competitor. It could have created a culture for collaboration"* AC mentions a broader picture *"securing the region (Vestlandet), and the fact that more doors are available to you that without collaboration would not be."*

Needs for Starting Collaboration

From the companies interviewed I have gathered information around what is needed to start collaboration or at least a process around collaboration. As mentioned earlier there has as far as my understanding goes been discussions around the subject before and also some attempts. The most important issue has already been described in the chapter *Expectations* and is the fact that collaboration has to be desired by the customers. There is a fear of investing on false grounds therefore a statement or letter of intent from Aker or equal is more or less a necessity to make progress. Furthermore KLM mentions "To formulate all formalities in a collaboration agreement, a business lawyer is needed. That is a competence we lack as of today" which is might be a small but important piece of the puzzle to increase trust/reliability among the parties involved.

The Perspective of a Customer

To understand both; the understandings of SMEs, and the customers perspective, more data is needed. An interview was conducted together with Aker Subsea to uncover their experience and point of view. This part of the chapter shows my customer interview data.

Former Experience

After speaking with a customer Aker Subsea (AS) their experience from collaborations is not entirely positive. It is hard to maintain control when there are more than one party to communicate with. Even so A expresses that they have tried

and are willing to invest in collaboration. *"We have been involved with NCE Subsea. Been on a few meetings with the section called Machining Companies within NCE Subsea with companies from all over Hordaland. They have been informed about our demands to material, execution the full package… It was rather few companies that were able to or willing to offer their services."* A describes a supplier from outside the region who had won a contract including machining and welding. *"They did not have welding in-house and used a company at Ågotnes to do the welding. Afterwards it caught our attention that we had totally lost control. The company based in Ågotnes had not fully understood our specifications and processes in different steps. Resulting in unusable parts both for us and our supplier... not being able to deliver in time."*

Customer - Future Collaboration

Concerns Collaboration

Thoughts around collaboration from AS point of view are the risks of having to communicate to more than one party. From a big brother perspective AS sees *"...the challenge might be that on one hand a wish to collaborate on the other hand they are competing."* As mentioned AS informs me, *"it is not always easy to know who we are supposed to interact with, who is the supplier that is the first thing… We need to contract ONE party who is responsible for machining, welding, surface treatment. What we need to be confident with is that the supplier has procedures to secure that the sub suppliers contracted are qualified for the operations needed…"* I presented a thought of using a administrative hub to AS. The response I received was that *"…contracting a hub is much more challenging than contracting a supplier who has at least two of the required processes in-house, at least that is my opinion"*

Structuring Collaboration and Expectations

AS has one main concern, to simplify work as much as possible for themselves and that the collaboration is competitive. Simplifying in the meaning of interacting with as few parties as possible, so called "one stop shop". Meaning "if we are to have a order produced including machining, welding, surface treatment we wish to interact with one part… the alternative is that we interact with one part who on his hand has an tied a third party to perform the tasks outside of his range. But that is quite challenging both for us and the supplier, to split up that way…" AS mentions that both he and the top management has worked hard to *"the extent of which it is possible, utilize*

resources (companies) within the region… with the motivation of it being within the region" but ordering from the region *"is under the presumption that companies are competitive on price, accuracy in delivery and quality."* Furthermore AS indicates that in the subsea segment there is a high barrier to reach a qualified level but AS has expressed that they are *"willing to contribute with the development of expertise needed, with the understanding that the companies involved have the backbone to invest themselves… Our desire would be to have the same possibilities here as we have in Stavanger, to find suppliers who can take on the full package, right."*

Needs for Starting Collaboration

To engage a collaboration seen from the customer point of view it is of great significance that it will be competitive. AS has indicated that they are willing to contribute to suppliers who are willing to invest. *"We are sourcing the market at all time. Based on hour need for capacity in the near future we have to locate which suppliers that are capable of delivering in the best manner, and we would like to contract…To ensure ourselves that we have sufficient capacity."*

Summary

In the result we can see that there is high consensus among how the machining companies would like collaboration to be formed. A new commonly owned company seems to all the machining companies to be a good solution when to form collaboration. None of the companies are willing to engage collaboration without a customer expressing interest in such collaboration. Aker has indicated some ambiguity regarding collaboration but is prepared to invest if the machining companies are willing. These data are summarized in a table (table 1) on the following page, together with a description.

Table of Opinions

Table 1 – Table Of Opinions

		Sub Contractors - SMEs			Customer
Perception \ Company		**Anonymous Company [AC]**	**K Lerøy Maskinering [KLM]**	**Partner Maskinering [PM]**	**Aker Subsea [AS]**
Former Experience	**Experience from type of collaboration**	Ad-Hoc	Ad-Hoc	Formal	Formal/ Ad-Hoc
	Mentioned lack of trust from customer	Yes	No	Yes	N/A
	Bad experience from former collaboration	No	No	Yes	Yes
	Collab. today are related to	Capacity	Capacity	No collab.	N/A
Future Collaboration	**Finance is considered an issue**	No	No	No	No
	Collaboration should be more formalized	Yes	Yes	Yes	Yes
	There are benefits besides the financials	Yes	Yes	Yes	Yes
	Interested in collaboration	Yes	Yes	Yes	Yes/No
	Largest challenge	Human Resources	Human Resources	Human Resources	N/A
	Customer demand	Important	Important	Important	N/A

Summary

Data from the result chapter is visualized in the table (table 1) above. There are indications of consensus among some of the topics, especially concerning future collaboration. In the summary the readings from the table are further described.

The table (table 1) is divided into four sections. On the left hand side, the views of the machining companies (SMEs) are displayed. The customer's perceptions and opinions are presented on the right hand side of the table. Furthermore, the table is vertically divided. The thick horizontal line separates all the data gathered, above the line, data based on experience is presented. Below, data related to the future scenario (appendix) is displayed.

Starting from the top of the table, the SMEs have experience of different types of collaboration from both ends of the continuum described by Haugland et al. (2011). Furthermore, concerning the SMEs lack of trust to Aker, their opinions also differ.

The topic related to experiences of collaboration the companies on the left who only have had ad-hoc collaboration had not experienced any problems. On the other hand the companies who had more formal collaboration had encountered problems bound to the collaboration.

There seems to be a high degree of consensus among the companies around how to form future collaboration. None of the companies thought finance would be an issue if collaboration were seen as sustainable option. All companies see benefits beyond the financial of formalizing collaboration. Further, all companies are interested in collaboration and the opportunities it brings, under the condition that there is a customer demand for forming collaboration.

Discussion

In this chapter the findings in the report are shared. To analyze the findings using the theory presented earlier. Based on this I write my conclusion and proposal for forming collaboration.

The purpose for my thesis has been to visualize the perception of machining companies in the Bergen region on how to form collaboration. The background behind the thesis started in an open forum where I was presented with the idea of machining companies collaboration. They aim to increase their competitiveness within the national and international industry. An industry that is expected growth in the future. A growth, which is mainly a result of an increased, installed base of subsea-products needing service on the ocean bed. Because of the interest for collaboration opportunities in the industry I have had an ambition to make the research available to the parties involved.

With the need of increased capacity as a backbone, the design of the thesis was created. A selection of relevant machining companies was together with government-initiated NCE Subsea chosen as interview objects. The companies chosen have approximately 20-30 employees and yearly revenue streams in the region of 30 - 50 MNOK. The companies are all within what is referred too as Small and Medium sized Companies (SMEs).

During my research I have looked further into the following research question:

What does machining companies comprehend as the future method of collaboration?

From the machining companies I have collected data through a series of in-depth interviews. The interviews are used together with the model of Dunne et al., (2002) which is also the base for the study. The structure of the interviews can be described as divided in two. The first part is to get to know my interview objects and their experience with collaboration(s), the second part is a constructive phase describing in some more detail the scenario created. During this last phase half the objects were presented with a case, to stimulate a common mindset. This was preferred to increase consistency for the answers regarding how collaboration could/should be formed in the future.

To reflect on my research question I have chosen to discuss the theory around Transaction Costs and the article of Haugland et.al (2011) concerning collaboration in service sectors. But first I will present my relevant findings.

As we can see from the *Table of Opinions* (table 1) there is high consensus among the companies on some interesting issues. It is interesting to see that there also is a consistency between the data I found and to some extent also the article of Haugland et al. (2011) supporting his theory.

In the article they mention problems around coordination of small companies. Two of the problems mentioned I have received data on from the machining companies. According to Haugland et al. (2011) companies may lack necessary financial and managerial resources to establish coordination, and managers in small companies often have limited time to devote to such activities. They also mention that there may be disagreement among the companies concerning how to share costs and benefits, and it may be difficult to find a company that is willing to be coordinator. I have in my research found that in there is little or no worry concerning the financial challenges related to collaboration. To quote K Lerøy Maskinering (KLM) "*I do not have any faith in financial resources being an obstacle".* All companies, do express the importance of having an agreement between potential customer and suppliers to support a credit conditioned investment. Compared to other industries the machining companies do not see finance as potential show stopper. If comparing industries I do believe there are characteristics that separate the industries in this matter and might explain this find. First of all the Oil and Gas industry is a capital-intensive sector where quality and safety are superior of cost. Could it be that the service-sector is more likely to be influenced by fluctuations in the market than the machining companies interviewed, and therefore are not as afraid as the service-companies mentioned in the article of Haugland et al. (2011).

Further Haugland et al., (2011) mentions managers of small companies might find it hard to allocate the time needed for organizing collaboration, they have enough work with keeping their own companies on track. Partner Maskinering (PM) confirmed the substance in theory by saying *"Depending on how collaboration is formed I do not know how much we can contribute on a management level, but we do not have a lot of excess manpower in our organization today"*. To further illustrate my findings up

together with the theory of Haugland et al. (2011) they mentions companies may find it hard to agree on how to share cost and benefits. When the interview objects where presented with this as a possible problem of collaboration, all companies meant it should be divided by owner share in the commonly owned company. Further, it was not really seen as a big problem but rather as Haugland et al. (2011) also mentions that some of them were not eager on becoming the coordinator alone of such a collaboration, since it could allocate a lot of time.

A concern that I found interesting was related to problems with collaboration. The companies I have interviewed expressed a fear of the company growing out of their control if they collaborate to closely with others. Therefore they found it important to determine the framework of a potential collaboration. Or as Anonymous Company (AC) puts it *"agrees on the width of the road",* helping all parties of collaboration to stay within the framework of the collaboration.

As presented above, the problems Haugland et al., (2011) mentions in his article are not fully corresponding with the statements of the companies. This means that we have different findings. What is the reason for this? In the Oil and Gas industry money is not a problem. If they can just get their foot inside the door then they can expect big future incomes, which is not a expected future within the service sector.

One of my main focuses has been to investigate how the companies would like collaboration to be organized. This I have done by using the model (see Figure 2). The result is a formalized collaboration where the parties involved establish a new independent company together. All the parties involved own a share; cost and benefits are shared and divided according to owner ratio similar to Joint Venture. Schilling (2010) describes Joint Ventures as a type of strategic alliance that entails significant structure and commitment. Further, a Joint Venture often involves an equity investment from each partner and often results in establishment of a new separate division. The capital and other resources to be committed by the involved parties are generally specified in carefully constructed contractual arrangements, as is the division of any profits earned by the new division.

The model of Dunne et al. (2002) (figure 2) describe how collaborations could be formed. From what I have found the companies are thinking about of starting a new company together. But what I have been asking myself is how come there is no such

form of collaboration among them already. Is it only because no one else has done it before? That is a question open for further investigation. Rather than focusing on the past I would like to look into what needs to be in place for creating successful collaboration. Coughlan et al. (2006) mentions that other industries have linked companies closer together by implementing vertical and horizontal integration. Through different mechanisms such as contracts, governance structures and common ownership companies that used to operate individually and were loosely coupled to each other, have entered structured systems regulating the operation of individual companies (Haugland et al., 2011).

As an example of how external parties have bought shares in companies to stimulate collaboration, I would like to present the well-known company Skistar. Skistar provides a one-stop-shop for customers to order skiing experiences. They provide services ranging from accommodation to ski lessons. Skistar has successfully been managing ski resorts providing an easy one-stop-shop alternative for customers. Maybe there are useful similarities that the SMEs of Bergen can learn from in their collaboration. Even though there are big differences between the industries, the fact is that Skistar today is a functioning corporation with increasing revenue (Skistar, 2011). Considering that the biggest fear of the machining companies is lack of moral and honesty. It should be possible, to search beyond industrial borders and learn from the experiences of companies within the service sector when structuring collaboration.

The companies interviewed are today aware of the risks when investigating new opportunities. They see the possibilities of lowering the risk and investment costs when collaborating. Benefits beyond the monetary ones are seen as desirable, but are not valued as equally important. Cooperation should be established to increase the value created inside the collaboration cluster compared to the value creation in absence of collaboration. The interviewed companies find it desirable entering a capital-intensive market such as the subsea industry. For further progress among the machining companies a green light from a large customer such as Aker is needed. This would hopefully help the machining companies to take the next step and successfully pursue collaboration entailed with asset specific investments.

My data indicate the companies are willing to take the investment needed together. To reduce risk a contract, Joint Venture or equal is more or less needed from a big

customer. During my interview with the customer (Aker) I got indications of them being willing to invest. This is definitely positive for both parts but the conversation needs to be between the parties involved and not through a researcher, to be of any value. To make collaboration reality an intervention providing Aker or other big contractor to sign contract or step in on the owner side is most likely required.

Transaction cost theory in its most simplest form could be described as: The bigger the asset specific investments made to be able to produce a product the higher the transaction costs. During the analysis of my data a new view of transaction costs occurred to me. What the companies here are really striving for is not entirely what is described within transaction cost theory. In our case I would like to argue that the machining companies are also working with a new parameter, which could be referred to as transaction capacity. Meaning instead of only using the traditional view were companies invest in physical equipment (building and machinery), human capital (employees with special competencies) to organization and strategy (development of common routines and systems) (Williamson, 1985). The machining companies are also using transaction capacity to meet customer demand. Together they may enter a market, which otherwise would be harder or maybe even unreachable.

Within value chain management we can consider two parameters, vertical and horizontal integration. Vertical integration is used to increase control typically from larger companies like Aker. I believe that to even be considered as a potential integration partner the machining companies must integrate horizontally. Through collaboration they can increase their capacity for managing orders from larger player such as Aker, satisfying their demand of a one-stop-shop. Together SMEs may share costs bound to asset specific investments, risk and human resources. Sharing these expends by integrating horizontally could also give SMEs a competitive advantage to the companies which, are today seen as competitors. By collaborating they may according to Perry and Porter (1985) lead to formation of a firm that due to having a higher capital share, is larger and in different shape than its constituent elements and this makes integration profitable for insiders be able to share costs and offer good economical solutions. Put another way collaboration may enable these companies to turn Transaction Cost into Transaction Capacity.

Implications and the Studys Validity

Many others before me have studied the effects of vertical integration. I have in this thesis looked into vertical integration made possible through horizontal integration. Introducing a new term transaction capacity.

Implications in relation to the report are from my point of view divided in three, implications for machining companies, Aker and external implications.

Machining companies in the Bergen region are willing to corporate on a more formal basis if it is beneficial from a financial perspective and wanted from a customer point of view. Out of the three managers upon which my data material is based I noticed no opposition of a more formal collaboration. This should be a good positive foundation of which to base collaboration. All parties see the importance of considering negative outcomes and how to handle them on before initiating collaboration. Most important though is that the intentions from Aker are clear.

For the customer in our case Aker, the most important implication will be to show interest for collaboration through investments and/or participation. During the interview with them I was given the impression of Aker truly would like a functioning collaboration but at the same time seeing the challenges of such collaboration. Because of this I think it is of great importance that Aker present their concerns, and what they are willing to offer to make collaboration reality. An investment from Aker together with the machining companies would definitely be of value for increasing commitment from both sides of the table.

From an external point of view my finding may be transferable to other similar contexts. Especially within the regional industries where it is likely to find similar challenges. But also outside the region where similar challenges could occur between small companies and large corporations the thoughts of the machining companies in the Bergen region could be of value.

Limitations and Future Studies

Limitations bound to the research are related to the number of units analysed. Due to the small amount of data collected it is hard to generalize.

Sending the final report to my interview objects before publishing would have been a further improvement of the irrigative process. Due to limited time there was not room for this even though it could have improved the validity further.

To further investigate the findings a similar study within another field would be of interest. Also increasing the number of companies interviewed would be of great value. This could be done with a quantitative method using this report as a basis to cover more objects. Further, a study of how all details surrounding a Joint Venture agreement should be written would be of great value to the parties involved.

Conclusion

The last few years' new and major fields have been discovered on the ocean bed outside Norway, in particular the Johan Sverdrup field should be mentioned. In addition, due to new technology and methods, the supplies of existing fields are continuously extended. The equipment used to extract resources from the reservoirs requires maintenance, regardless to, if production is placed above or below sea level. An expansion of the installed equipment base increases the capacity requirements from all players within the industry. An increased demand may generate great opportunities for new entrants. SMEs in the Bergen area are today collaborating on an ad-hoc basis, creating opportunities for further coordination. Being too small on their own to meet all the demands from the customers, ranging from financial risk taking to lack of competence. The model proposed to solve these dilemmas, is for the SMEs to establish a Joint Venture, each of them investing in the new, common company; sharing risk and profits. In addition, there is the possibility of also including the Main Supplier in this context. One of my main findings is that all the parties mentioned in fact are interested in the concept, and thus mean that collaboration may be an important tool to enter the Oil and Gas subsea market. Certainly, there may be a giant leap from good intentions to a concrete Joint Venture collaboration between the SMEs and the main suppliers, but the answers I get from the interviews indicates that the intentions are strong and well meant. From my perspective the most important finding, is that for a collaboration to become reality, the customer call for collaboration is a necessity.

References

BOLMAN, L. G. & DEAL, T. E. 1998. *Nytt perspektiv pa organisasjon og ledelse: strukturer, sosiale relasjoner, politikk og symboler*, Ad Notam Gyldendal.

BRYMAN, A. & BELL, E. 2007. *Business research methods*, Oxford University Press, USA.

BURGESS, R. G. 1982. *Field Research: A Source Book and Field Manual,* London, Allen and Unwin.

CANNON, J. P., ACHROL, R. S. & GUNDLACH, G. T. 2000. Contracts, norms, and plural form governance. *Journal of the Academy of Marketing Science,* 28**,** 180-194.

COHEN, W. M. & LEVINTHAL, D. A. 1990. Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly***,** 128-152.

COUGHLAN, A. T., ANDERSON, E., E STERN, L. W., & EL-ANSARY, A. I. 2006. Marketing Channels.

CRAVO, T. A. 2011. Are small employers more cyclically sensitive? Evidence from Brazil. *Journal of Macroeconomics*.

DENSCOMBE, M. 2007. *The good research guide: for small-scale social research projects*, Open University Press.

DUNNE, P., LUSCH, R. & GRIFFITH, D. 2002. Retailing, 4. *Aufl., Mason/OH*.

ENERGIDEPARTEMENTET, O.-O. 2010. *Norsk oljehistorie på 5 minutter* [Online]. Available: http://www.regjeringen.no/nb/dep/oed/tema/olje_og_gass/norsk-oljehistorie-pa-5-minutter.html?id=440538.

FORTSON, R. 2004. An Analysis of Possible Oil Industry Ownership Structures in Post-War Iraq. Tallahasse: Department of Economics.

HALLEN, L., JOHANSON, J. & SEYED-MOHAMED, N. 1991. Interfirm adaptation in business relationships. *The Journal of Marketing***,** 29-37.

HAMMARKVIST, K. O., HAKANSSON, H. & MATTSSON, L. G. 1982. *Marknadsforing for konkurrenskraft*, Liber ekonomi.

HAUGLAND, S. A. 1996. *Samarbeid, allianser og nettverk*, Tano Aschehoug.

HAUGLAND, S. A., NESS, H., GR√∏NSETH, B. O. & AARSTAD, J. 2011. Development of tourism destinations: An Integrated Multilevel Perspective. *Annals of Tourism Research,* 38**,** 268-290.

HOLLAND, K. 2012. *Delta Airlines Buys Phillips Refinery to Cut Fuel Costs* [Online]. Available: http://airnation.net/2012/05/01/delta-airlines-buys-phillips-refinery/.

ISAKSEN, A. 2009. Innovation dynamics of global competitive regional clusters: The case of the Norwegian centres of expertise. *Regional Studies,* 43**,** 1155-1166.

JONES, S. 1985. The analysis of depth interviews. *Applied qualitative research***,** 56-70.

KING, N., CASSELL, C. & SYMON, G. 2004. Using templates in the thematic analysis of texts. *Essential guide to qualitative methods in organizational research***,** 256-270.

MARK EASTERBY-SMITH, R. T., PAUL R.JACKSON 2008. *Management Research*, SAGE.

MCGUINNESS, T. 1994. Markets and managerial hierarchies. *Markets, Hierarchies and Networks*, 66-81.
PERRY, M. K. & PORTER, R. H. 1985. Oligopoly and the incentive for horizontal merger. *The American Economic Review,* 75, 219-227.
PORTER, M. E. 1998. *Competitive advantage: creating and sustaining superior performance: with a new introduction*, Free Pr.
SAXENA, G. & ILBERY, B. 2008. Integrated rural tourism a border case study. *Annals of Tourism Research,* 35, 233-254.
SCHILLING, M. A. 2010. *STRATEGIC MANAGEMENT OF TECHNOLOGICAL INNOVATION*.
SKISTAR. 2011. *General Annual Meeting 2011* [Online]. Sälen. Available: http://corporate.skistar.com/upload/VD-presentation,%20111210.pdf.
SSB, S. S. 2012. *Number of unemployed* [Online]. Available: http://www.ssb.no/arbeid/main.shtml [Accessed 2012-04-10.
TINSLEY, R. & LYNCH, P. 2001. Small tourism business networks and destination development. *International Journal of Hospitality Management,* 20, 367-378.
TORTORIELLO, M. & KRACKHARDT, D. 2010. Activating cross-boundary knowledge: the role of Simmelian ties in the generation of innovations. *The Academy of Management Journal (AMJ),* 53, 167-181.
WEBER, M. 1947. The theory of economic and social organization. *Trans. AM Henderson and Talcott Parsons. New York: Oxford University Press*.
WESTWOOD, D. 2011. *The World Subsea Hardware Market Report 2011-2015* [Online]. Available: http://www.douglas-westwood.com/shop/shop-infopage.php?longref=678~0&searchterm=%20subsea.
WILLIAMSON, O. E. 1985. The Economic Institutions of Capitalism.
WILLIAMSON, O. E. 1991. Comparative Economic Organization: The Analysis of Discrete Structural Alternatives. *Administrative Science Quarterly,* 36, 269-296.
WORLDOIL. 2009. *Drilling Technology* [Online]. Available: http://www.worldoil.com/April-2009-Testing-a-new-software-system-for-drilling-supervision.html [Accessed 14-05 2012].
YIN, R. K. 2011. *Applications of case study research*, Sage Publications, Inc.
ØKLAND, J. 2012. *Aker Solutions vinner milliardkontrakt* [Online]. offshore.no. Available: http://www.offshore.no/sak/Aker_Solutions_vinner_milliardkontrakt [Accessed 28.02.2012 13:38:52.

Appendix

The Scenario

A supplying company for example Aker or equal has just received a big order from Statoil. The order is to deliver a complete complex subsea system including everything from development of new structure to manufacturing and installation. Aker has already decided on their partners in development and also how the installation will take place. The only piece missing is how and where to build and machine the products that are to be positioned on the seabed. Aker usually orders from Kongsberg Offshore but is now planning to search for new and closer alternatives (primarily within the region of Bergen) due to increased demand and shorter lead-time.

The system to be manufactured is designed to last for 25-year life and is to be commissioned and qualified every five years. Having competence close to the equipment is a great advantage when to order new parts for commissioning. This means there has to be a series of qualifications of material and tools before placing it subsea to minimize risk of failure. There order is possible to split into four main sections to be covered: Welding, small machining work, small machining, and surface treatment.

About the deliverables: It is a “standard” template for North sea-solution with four wellheads within the manifold and one X-mas tree as well as a protective structure for over trawling will be built.

There are a lot of questions around how the companies in the Bergen region are to handle such an order since the companies today are to small to take it on by themselves. Some of the questions, which need to be addressed, are around the following subjects:

Interview Guide Aker

Collaboration

- Is there any established collaboration as of today?
    - What are your former experiences with collaborations?
- What are your biggest concerns with establishing collaboration?
- What do you expect from a collaboration partner?
- Beyond the monetarily benefits what do you see as an outcome from collaboration?
- What do you need from a customer to establish collaboration?
- Are you willing to collaborate if given the opportunity?
- Are you willing to specialize and stick to your specialty to create a competitive front?
- Restructuring might be necessary to enable collaboration, what are your premises for starting restructuring of your company?

Internal Processes for future work

- Describe a typical project process?
- What IT systems do you use today?

What is interesting to get from Aker?

- A real case scenario
- What are the deliverables from today's suppliers which small companies cannot match today. (one package deal?)
- Akers view on benefits from ordering regionally
- Previous thoughts of why it has not been a natural place to order.
- Thoughts around switching suppliers? It has been said in other cases (statoil meeting) that the only reason for switching supplier is when something has been handled badly is that the case?
- Akers Experince with small actors previously?
- What are your thoughts around collaboration between machining companies?
    - Success or disaster?

Interview Guide Machining Companies

Background

Please introduce yourself and your company briefly

Name of company:

Branch:

Revenue:

Number of employees:

Core competence:

Former experience with the Oil and Gas industry, your perception of the industry?

Collaboration

Do you have any established collaboration with other companies as of today?

What type of collaboration is it?

- Market / Capacity / Other forms?

How are collaborations formed today?

- Formal or informal?
- Pros and cons?

Describe the balance between collaboration / competition?

Aspects on and experience with collaboration as a basis for increased competitiveness and visibility in new markets?

- Strengths and weaknesses

What is your experience with collaboration?

- Experience from formal / informal collaboration

Benefits and challenges due to collaboration?

What do you expect from your partner when in collaboration?

Has there been any restructuring due to earlier collaborations?

Presentation of the scenario (see appendix) created together with Aker and Hauglands model of collaboration.

Collaboration

* How would you describe the collaboration needed for the task? (Related to Hauglands model)

Why? Experience? Formal or informal? Pros and cons?

* To which extent theory a challenge?

* How do you feel about investing resources in a cooperative initative? Any concerns about others reaping benefits while refusing to carry costs?

* Do you think your company has resources (financial/managerial/time) to establish coordination with other companies? What is most critical?

* What do you think is most important to make collaboration work?

* What is your biggest concern with collaboration?

* Would your company be willing to act as coordinator for collaboration?

Do you see any problems with the balance between collaboration / competition?

Benefits and challenges due to collaboration?

What do you expect to come out from a collaboration of this nature?

Expectations on partner/yourself

Expectations customer (Aker)

Are you willing to collaborate with competitor if given the opportunity?

Restructuring might be necessary to enable collaboration, what are your premises for restructuring of your company?

How do you see costs and benefits being shared?

What competence do you lack as of today and would be needed from?

What do you see as the best possible outcome from collaborating?